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# PATENT SPECIFICATION

(1)

1 336 104

## DRAWINGS ATTACHED

1 336 104  
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 A4F 11A4B 12A  
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## (54) IMPROVEMENTS IN OR RELATING TO SUCTION CLEANERS

(71) We, R.G. DIXON & COMPANY LIMITED, a British Company, of Lancelot Road, Wembley, Middlesex, do hereby declare the invention, for which we pray that 5 a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to suction cleaners 10 of the type including a generally vertical drive shaft carrying an impeller for a suction fan and a brush or the like having a generally horizontal axis of rotation and driven from the drive shaft.

15 Conventionally, a belt drive is used between the drive shaft and the brush or the like to obtain the change of angle, and it is also necessary to have a considerable speed reduction, which has hitherto been 20 obtained in the belt drive.

The present invention consists in a suction cleaner of the type described, comprising an intermediate drive member mounted on an intermediate shaft for rotation about an axis of rotation parallel with the drive shaft, the intermediate drive member being driven by the drive shaft 25 at a reduced speed, and a belt drive between the intermediate drive member and the brush or the like.

The belt drive may be substantially a 1:1 drive.

The speed reduction may be obtained by a friction drive or otherwise.

35 The invention has the advantage that the belt pulleys may both be of comparatively large diameter, leading to improved belt life when compared with the conventional use of a reduced diameter end portion of 40 the drive shaft for driving the belt, which causes heavy flexing of the belt and shortens its useful life. Also, the amount of speed reduction obtainable is greater than with the conventional arrangement, so 45 that the brush speed can be reduced, thereby [Price 25p]

increasing the brush life.

In order to improve the air flow through the casing of the cleaner, air guide plates may be included to streamline the air flow from the region of the brush or the like 50 to the impeller inlet. This improves the air flow and reduces the noise level.

The invention will be further described with reference to the drawings accompanying the provisional specification, which 55 drawings show a preferred embodiment of the invention.

In the drawings:

Figure 1 is a bottom plan view of a form of suction cleaner according to a 60 preferred form of the invention; and

Figure 2 is a vertical section of the cleaner of Figure 1 with some parts omitted for clarity.

The drawings show a suction cleaner 65 having a casing 1 in which are mounted rear wheels 2 and forward wheels 3 in a generally conventional manner. A forward brush assembly 4 comprises a horizontal brush shaft 5 on which is mounted one 70 or more brush elements 6 arranged in helical manner along the shaft 5. The shaft 5 is freely mounted in bearings in the casing 1 and carries a drive pulley 7 of adjustable width. 75

The or each brush element 6 is arranged to project through elongated apertures in a grit tray 8 to bear on a carpet to be treated.

The casing 1 includes an impeller chamber 9 in which is mounted an impeller carried by a drive shaft 10 which extends down into the casing 1 through an aperture 11, and has a wear resistant sleeve 12 e.g. of mild steel mounted on its extreme lower 85 end. Parallel with the drive shaft 11, there is mounted on a fixed spindle 13 on which is freely mounted a pulley 14 integral with a disc 15 carrying a soft rubber tyre 16 engaging the sleeve 12. The resilience of 90

the tyre 16 is chosen so that it maintains good frictional contact with the sleeve 12. A tension belt 17 connects the pulley 14 with the pulley 7 on the brush shaft 5.

5 It can be seen that as the shaft 10 rotates, the engagement between the sleeve 12 and tyre 16 drives the pulley 14 at a reduced speed, and this reduced speed drive is transferred to the brush shaft 5 by the belt 17, with the required 90° twist. The pulleys 14 and 7 are of essentially the same diameter, so that there is no effective speed reduction between the pulley 14 and the shaft 5, but further reduction could be 10 effected here if required. It will be appreciated that by having a speed reduction independent of the belt 17, there is no need for the belt 17 to pass over very small diameter driving zones, so that the degree of flexure to which it is subjected 15 in use is reduced and its life is prolonged. The use of a soft rubber tyre 16, which may be of a form similar to that used for tension drive belts, removes the necessity 20 for independent spring loading between the shaft 10 and the disc 15.

In order to improve the air flow between the air entry through the slot in the grit tray 8 and the aperture 11 leading to the 30 impeller chamber 9, air guide plates 18 are provided which have the effect of maintaining the air flow passage of reasonably constant cross sectional area as it passes from the long narrow aperture at the forward end of the machine to the angular aperture 11. These plates have the effect of improving the smoothness of the air flow 35 and thereby reducing the noise level of the machine.

Various modifications may be made 40 within the scope of the invention.

#### WHAT WE CLAIM IS:—

1. A suction cleaner of the type described, comprising an intermediate drive member mounted on an intermediate shaft for rotation about an axis of rotation parallel with the drive shaft, the intermediate drive member being driven by the drive shaft at a reduced speed, and a belt 45 drive between the intermediate drive member and the brush or the like.

2. A suction cleaner as claimed in claim 1, in which the belt drive is substantially 50 1:1.

3. A suction cleaner as claimed in claim 1 or 2, in which the speed reduction is obtained by a friction drive between the drive shaft and a portion of the intermediate member.

4. A suction cleaner as claimed in claim 3, in which the said portion carries a soft rubber tyre engageable with the drive shaft.

5. A suction cleaner as claimed in claims 1, 2, 3 or 4, comprising air guide plates to streamline the air flow from the region of the brush to the impeller inlet.

6. A suction cleaner substantially as hereinbefore described with reference to 70 the drawings accompanying the provisional specification.

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2 SHEETS

PROVISIONAL SPECIFICATION  
This drawing is a reproduction of  
the Original on a reduced scale.  
SHEET 1

FIG.1.



